Australian Government
Department of Agriculture and Water Resources

Machinery Cleaning Guide - Caterpillar and Komatsu Dump Trucks

Biosecurity

Publication series

April 2016

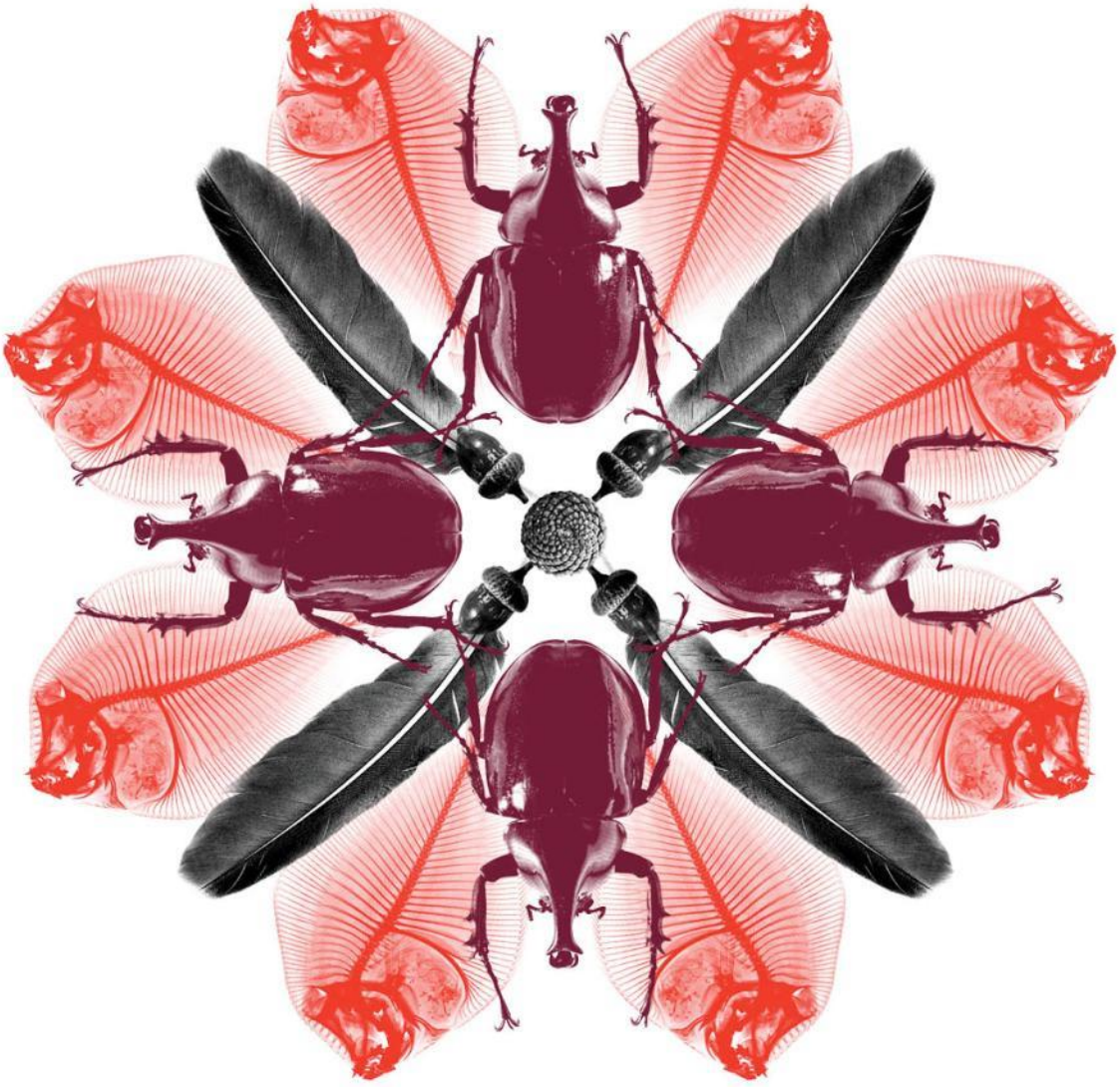

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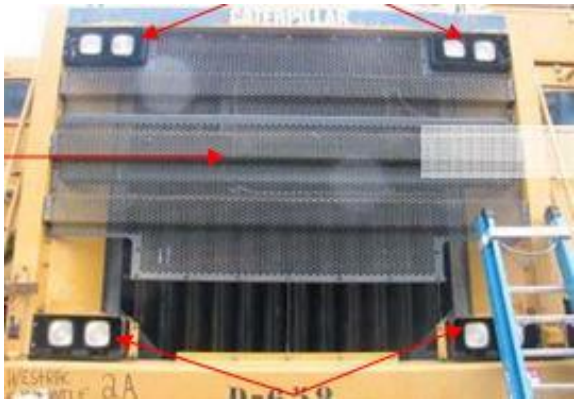
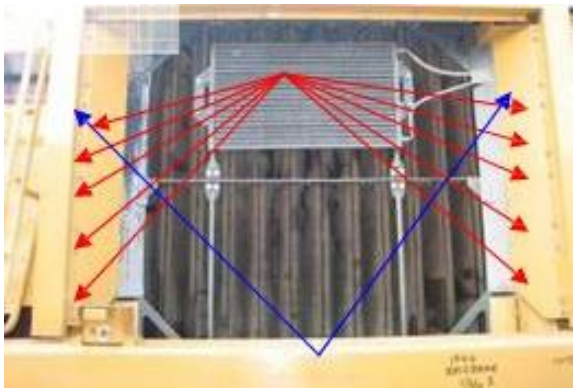
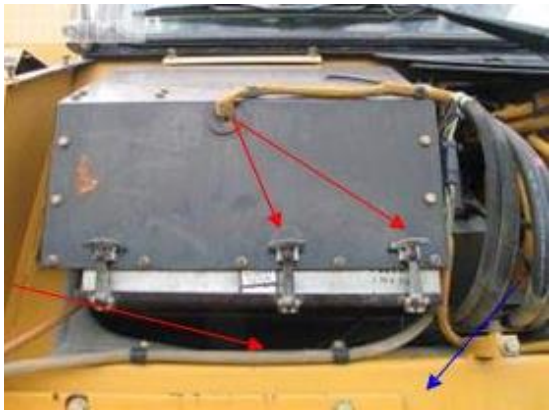
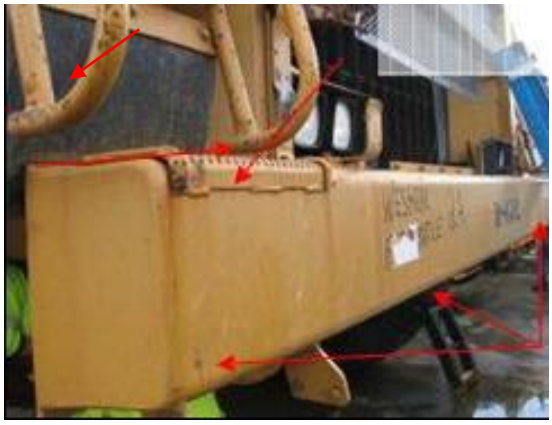
Table of Contents

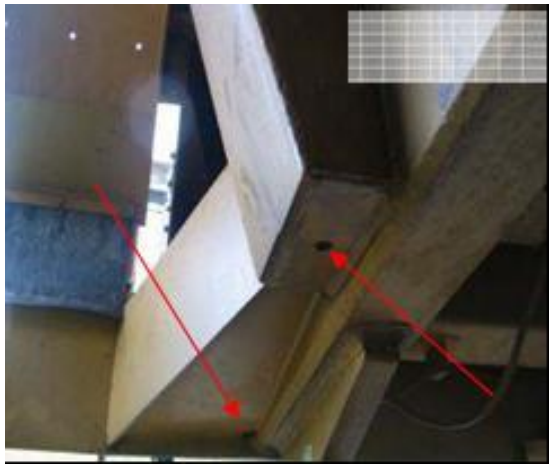
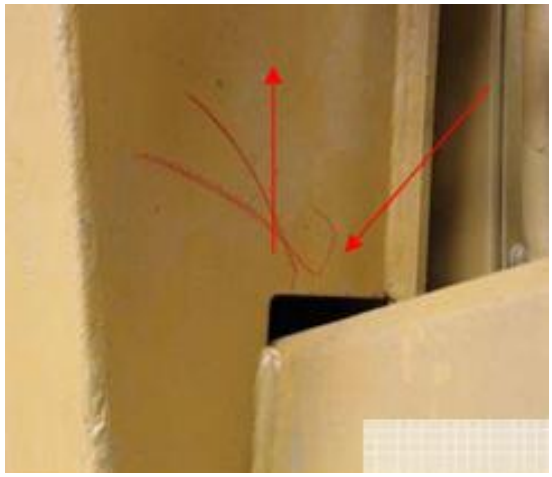
Cleaning guidelines

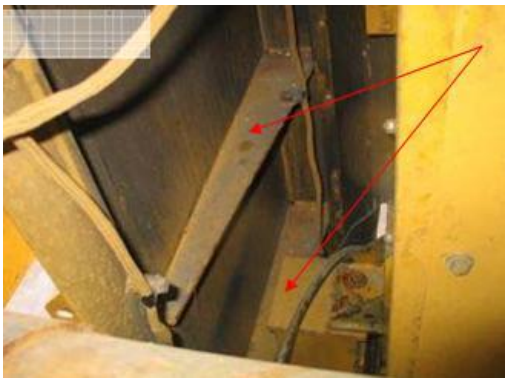
Front end and radiator

Description	Images
This photo shows the radiator grill still in place as well as the four sets of lights (red arrows). The grill and the lights must be removed.	
This photo shows how the grill and lights have been removed allowing proper access to the radiator and oil cooler fins. The red arrows indicate the areas either side of the radiator where a series of horizontal ledges can be found. These ledges can be accessed from either the front (pull back the vertical black rubber covers seen on either side of the radiator) or once inside the engine bay. These ledges are notorious for harbouring biosecurity risk material. The blue arrows indicate the ledges that are located behind the area where the lights are positioned. Without removing the top lights, these areas cannot be accessed.	
The panels in front of the cabin, which house the air-conditioning and electrics must be removed. All hollow handrail tubing must be flushed in the presence of the inspecting officer. Check all light covers for damage (red arrows).	

Description	Images
This photo shows the front cabin panels removed, allowing access to the air-conditioning and electrics. Best to use a telescopic or flexible mirror to inspect all areas inside. All light covers must be checked (red arrows).	
Close ups of the air-conditioning and electrical systems found behind the panels at the front of the cabin. On the left, these tie-down hooks (red arrows) must be loosened off to reveal inside the air-conditioning unit – check filters. The blue arrows in each photo indicate part of the box channel housing of the cabin air-con and electrics inspect in behind this box channel. The use of telescopic or flexible mirrors can facilitate the inspection. **N.B**. This area can also be accessed when the panel under the cabin floor has been removed – See page 7. Access from the underside of the cabin does not negate the need to remove these front panels.	 

Description	Images
Main focus of this photo is the front drawbar. On some models these have drainage holes either near the ends or along the underside. This drawbar must be fully checked for any evidence of drainage holes, cracks, splits or evidence of repair. Check the access ladders as the one highlighted above is made of hollow tubing with no end caps. These must be flushed in the presence of the inspecting officer. Any checker-plate or non-slip flooring must also be thoroughly flushed.	
On some models the air-filters are found in a variety of locations. This one is below the cabin and has several hollow channels as highlighted by the red arrow. Filters must be removed and blown with air to verify cleanliness. Have any other non-affixed panels dismantled to allow full access.	
Another example of the front end of a dump truck. This one has an open-ended channel running along the topside of the radiator. To correctly verify if radiator/oil cooling fins are clean, they require flushing from both sides. In this instance, the oil cooling system will need to be removed. This does not require full removal – on some models only a few bolts on one side need to be removed and this front unit can be swung outwards (red arrows).	

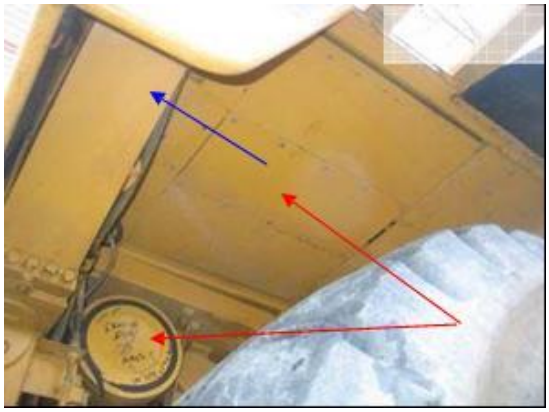
Description	Images
The two red arrows on the centre of the photo show the vertical section of the chassis. These sections are hollow, have drainage holes and require flushing in the presence of the inspecting officer. See next series of photos.	
Vertical chassis support found either side of the radiator. Note the drainage hole on the underside (red arrows) – must be flushed in the presence of the inspecting officer. Note the small drainage hole seen towards the bottom of the photo – another box channel, which also requires flushing.	
This picture also shows another entrance point to this vertical chassis support. In this instance the drainage hole is in a different area and will require flushing with a 90-degree tip. Water must be forced upwards to remove any biosecurity risk material (red arrows).	

Description	Images
These pictures show both the external and internal view of where the horizontal fins are located on each side of the radiator (red arrows). These can be accessed from either the front (pull back black rubber sheets from either side of the radiator) or from in the engine bay, as seen in the view below.	 

Cabin

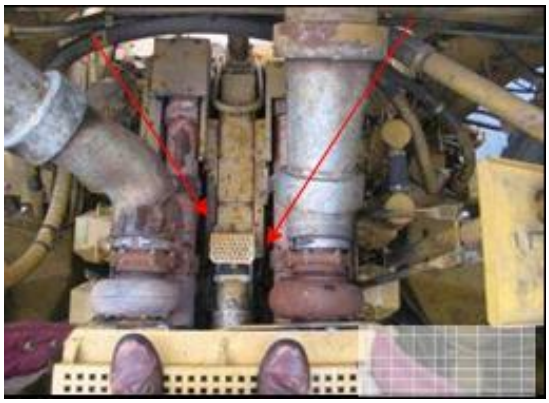
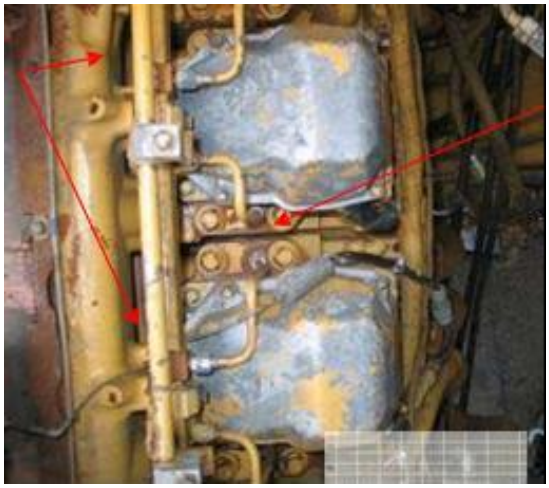
Description	Images
Dump truck cabin. The red arrow shows the rear panel before it is removed.	

Description	Images
This photo shows the rear panel removed. This area can contain the computer chips (red arrow) so cleaning can be difficult and it is best to clean with a damp rag. This area is usually well sealed, however biosecurity risk material has been found in these areas.	
Depending on the configuration, the internal door void (red arrow) may harbour biosecurity risk material.	
The internal of any cabin requires extensive cleaning and inspection. Biosecurity risk material has previously been found in some air-conditioning vents and therefore is an area of interest to the department (red arrows).	
All seats need to be removed to allow proper inspection of the underside of the seat and the rubber shroud. Below the seat, like in the illustration, there is a small hollow box section, which also needs to be inspected (red arrows). Without removing the seat, access may not be possible.	

Description	Images
A view of the bottom of the cabin floor as seen from underneath. All non-affixed panels need to be removed to enable thorough cleaning and inspection. Once these panels are removed, this allows rear access to the cabin air-conditioning and electrics as shown on page 3. All air-filters need to be removed and blown with air to verify cleanliness.	

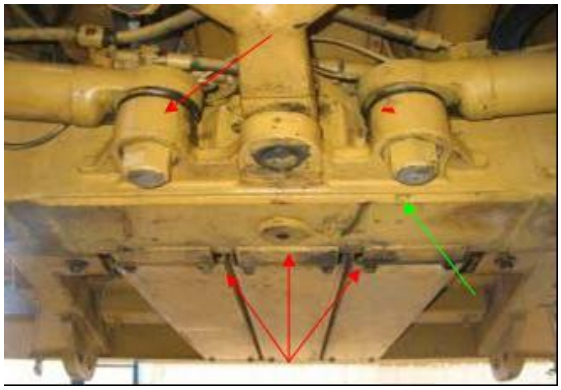
Engine bay and housing

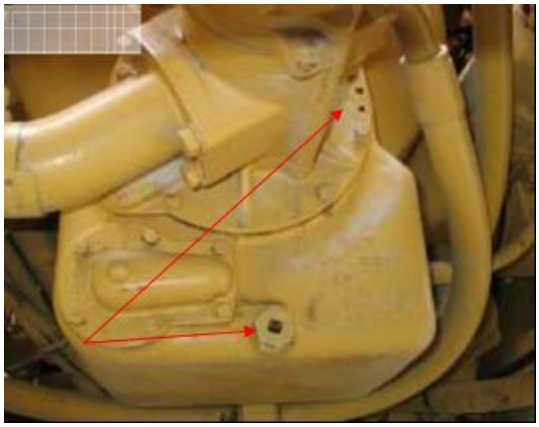
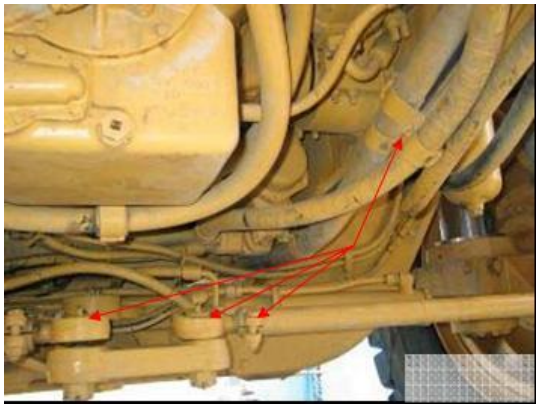
The safest way to access this area is by ascending the front ladder and once on top of the engine housing, have the engine covers lifted. This area below the engine housing can be surrounded by numerous hollow channels, which all require flushing in the presence of the inspecting officer to verify clean.

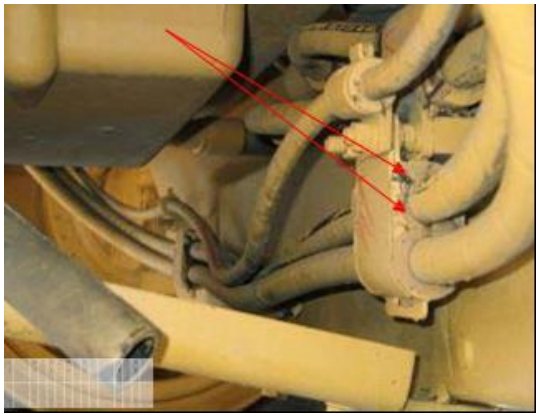
Description	Images
Cabin housing is lifted. The red arrows in this photo show the channels that run along the top of the block. These must be inspected and flushed to verify cleanliness.	
The small areas between each rocker/tappet cover must be thoroughly cleaned and inspected (red arrows).	

Description	Images
Where the engine cover hinges attach to the frame, this box section is hollow and has been known to harbour biosecurity risk material (red arrows). It appears to be a solid, sealed section; however there are access points, which cannot be seen from this view. On the opposite side, on each end, there are small triangular openings, which allow access for flushing.	 
Opposite view of box channel where engine cover hinges attach. Note the small triangular access point (red arrows), located at either end of this box section. This must be flushed in the presence of the inspecting officer.	
The myriad of electrical cables exiting the side of the cabin wall to various parts of the machine. All need to be checked for cleanliness. The red arrow on the right shows the small gap under the cabin, which also requires flushing.	

Description	Images
The housing above the radiator. These hollow box sections are only spot welded into place and therefore biosecurity risk material may be present (red arrows). All individual box sections require flushing – a pin jet is best for gaining access.	 
Side view of the right hand side of the engine block. As well as checking all other areas, the gap between the tappet covers can harbour biosecurity risk material. Some flushing in this area is required.	
Ensure that the back surfaces of components such as the oil filters are clean (red arrow).	

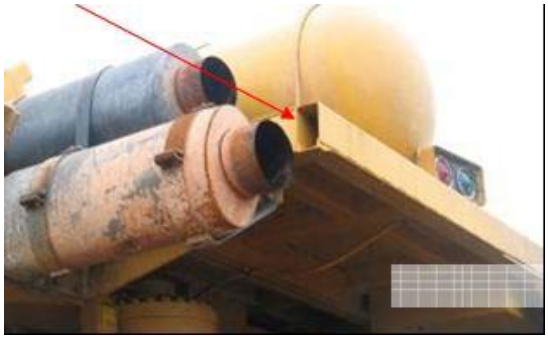
Description	Images
The harmonic balancers must be cleaned as well as the small opening below the block as seen in the picture on the right (red arrows).	 
To facilitate access to the front on the block (harmonic balancers and radiator shroud), the belly plates require to be removed (red arrows). Also ensure all pivot point joints (red arrows) are free of all contaminated grease. The green arrow shows a drainage hole in the front wishbone – this will be further highlighted.	

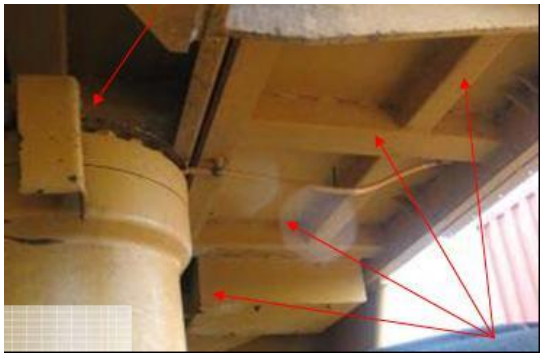
Description	Images
Large areas like these are easy to clean and inspect, however the small countersunk holes (red arrows) are often overlooked.	
Pivot points and a myriad of hydraulic hoses (red arrows) – all require thorough cleaning and inspection. In some instances, zip-ties may need to be removed to facilitate the cleaning process.	
The small openings at the end of the pivot points are often overlooked when cleaning (red arrows). The image to the right shows the area above belly plate (along front of wishbone) that requires thorough inspection.	

Description	Images
Areas above belly plate (along front of wishbone) that requires thorough inspection (red arrows).	 

Wheel arches and hollow segments

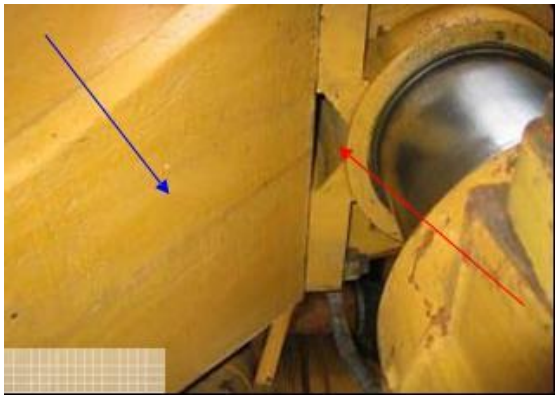
Description	Images
The right hand wheel arch on most dump trucks is the most difficult to clean and inspect (red arrows). These wheel arches consist of box channels, most of which have small triangular openings at the ends. These openings are further demonstrated in this series of photographs. Check all open ended hand rail tubing (will require flushing) and circular tubing around the wheel arch for any drainage points (if present, they will also require flushing).	

Description	Images
The outside channelling is sometimes open ended (red arrows), as seen above. These areas require flushing to remove all biosecurity risk material.	
View of the underside of the right hand wheel arch. All these highlighted channels (red arrows) are hollow and have small triangular openings on the ends. All require flushing with a 90-degree lance in the presence of the inspecting officer. If spot welded, they still require verification.	
The left hand wheel arch is not quite as complicated, but still requires that the panelling from under the cabin is removed. Check the ledges behind the tyre for biosecurity risk material (red arrows). On some Komatsu models, these ledges are covered but still have access and flushing points.	
Red arrows indicate the small triangular openings that are found at the ends of these box sections.	

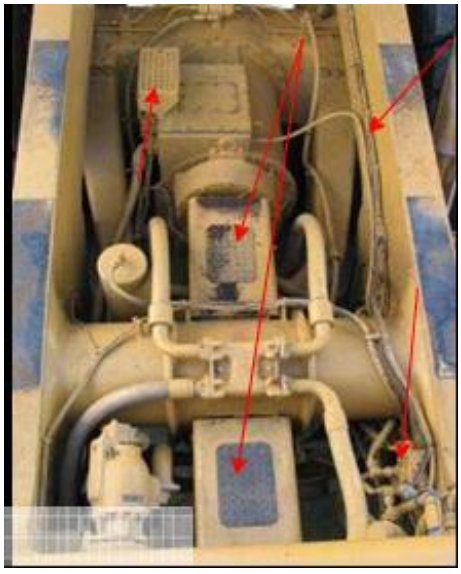
Description	Images
More box sections from another view (red arrows). Remove all contaminated grease from the struts located on each side.	

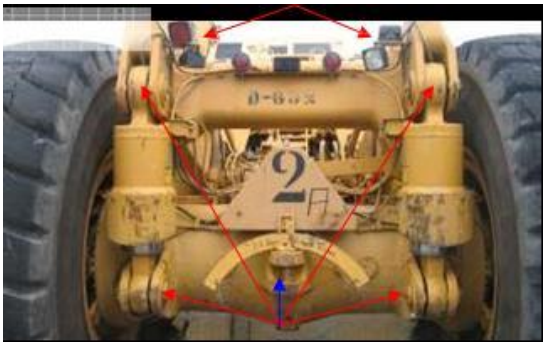
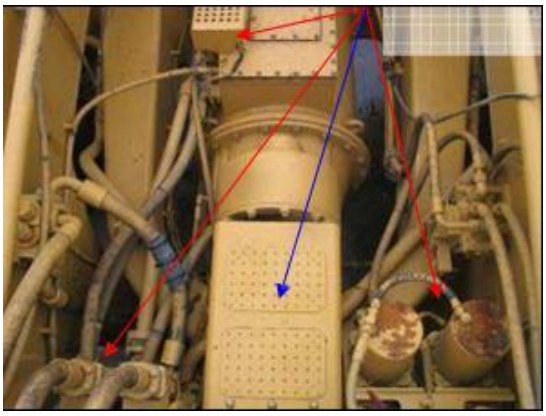
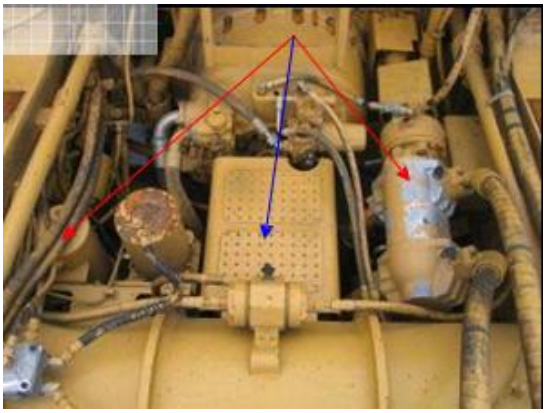
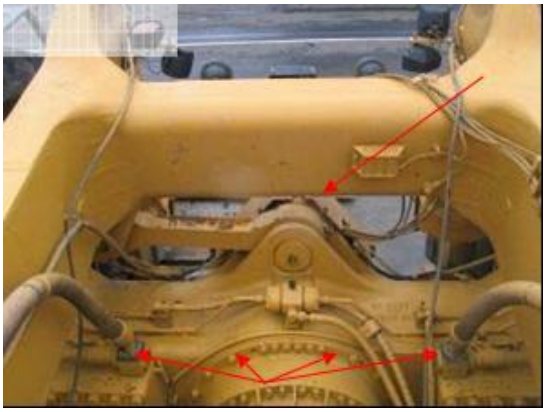
Chassis

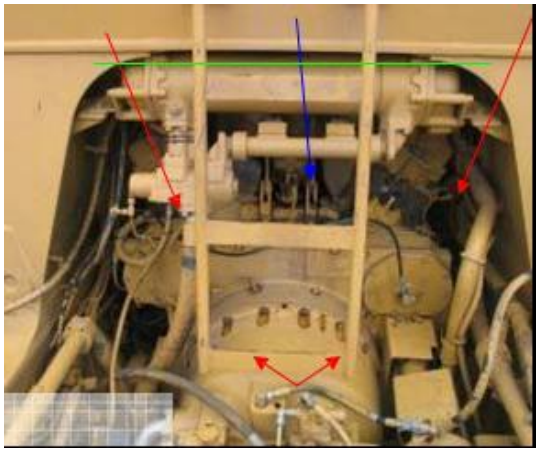
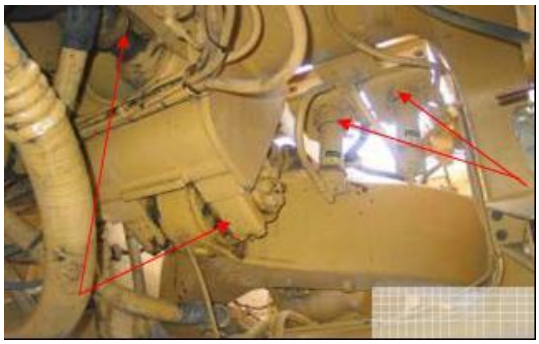
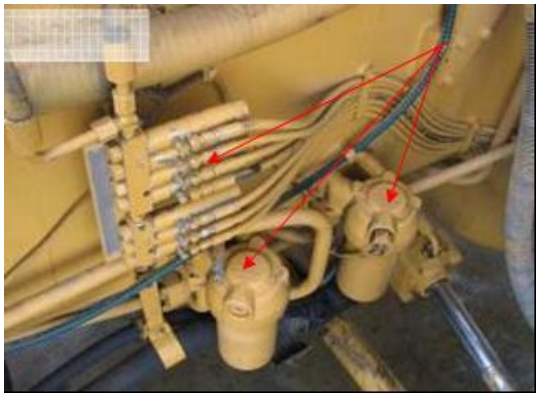
Description	Images
Located just inside each front tyre and rim are two vertical struts. These struts attach to the wishbone, which on the CAT series of dump trucks is a hollow and accessible area that needs thorough flushing to ensure it is clean.	 

Description	Images
Biosecurity risk material can enter the wishbone via these holes, located just inside either strut. The wishbone (blue arrow) appears to be a solid mass, but inside is hollow and contains a series of ribs, which can make removing biosecurity risk material difficult. To enable these areas to be properly flushed and cleaned, a long lance with a 90-degree tip is required and is inserted up the area indicated by the red arrow.	
Just right of centre at the rear of the wishbone is a small drainage hole (green arrow). Flushing via the two entrance holes located below either strut will result in water draining from this hole. **N.B**. It can literally take hours to flush this wishbone clean.	

Rear end

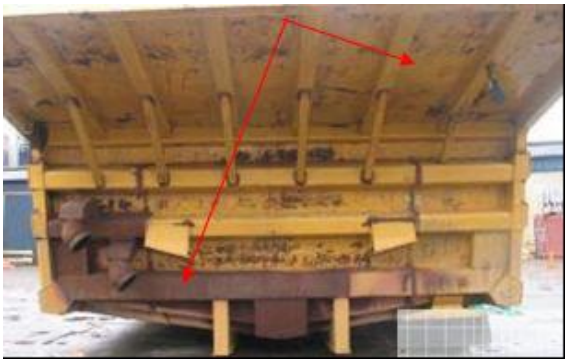
Description	Images
Ensure the tray is lifted and locking pins put in place. Inspect all surfaces including all hydraulic and electrical hoses, horizontal plates and chassis frame (red arrows).	

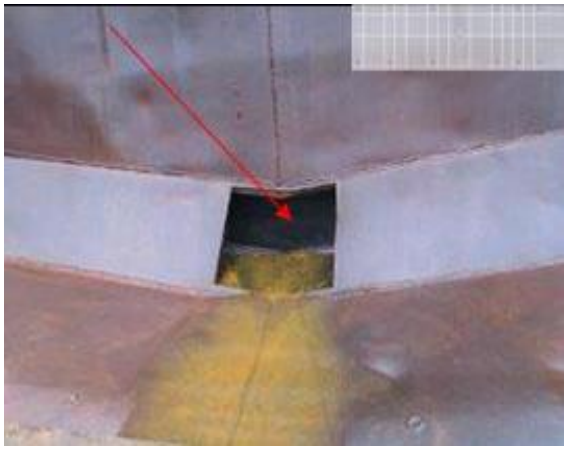
Description	Images
The rear end of the dump truck with the tray removed. Ensure all pivot points have all contaminated grease removed, all light covers checked (red arrows - best to look inside) and the towing pin (blue arrow).	
These photos are of the same area, just taken from different perspectives. The blue arrow indicates a non-affixed panel, which when removed, facilitates both cleaning and inspection. Each hydraulic and electrical hose needs individual attention (red arrows).	 
The rear chassis from above. Check pivot points to ensure all contaminated grease has been removed. Check all hydraulic couplings as well as any countersunk areas above the diff (red arrows).	

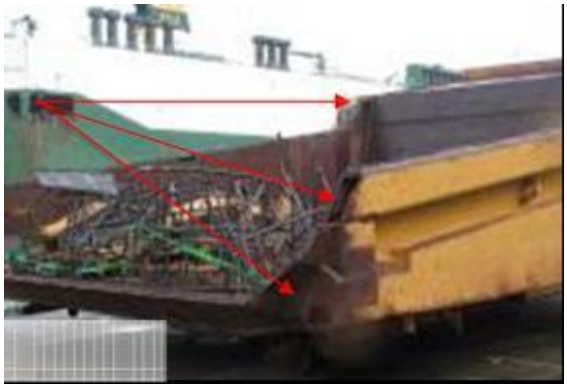
Description	Images
The back of the engine block and ladder (red arrows – if present). Check all hoses, hydraulic and electrical harnesses as well as the back of the engine block (blue arrow). On some models there is a U-shaped channel (indicated by the green line), which keeps hydraulic and electrical lines off the block as they pass over. This U shaped channel can be accessed from either inside the engine bay, or from behind. Ensure the channel is flushed to verified cleanliness.	
The rear of the dump truck from the underside. This area consists of chassis framework, pivot points and a universal joint (red arrows). All require careful inspection and viewing from several angles.	
A close up of the underside showing the universal joint and a conglomeration of hydraulic hoses. These hoses require to have the zip-ties or clamps removed to enable cleaning and inspection (red arrows).	
The opposite side and forward of the fuel cell. Several cylinders and hydraulic lines can be found here, also requiring inspection (red arrows).	

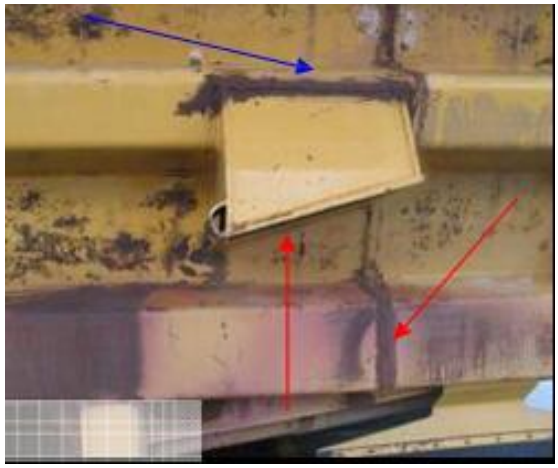
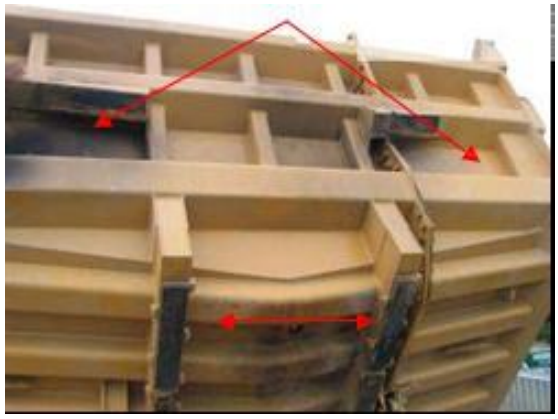
Description	Images
There are numerous structures such as the one highlighted left (red arrows), all requiring inspection from various angles to ensure cleanliness.	
The red arrows indicate the exhaust pipe housing. On some models a drainage hole can be found either halfway along, or at the end. This housing requires flushing to verify cleanliness. On this model, the area is fully sealed.	

Tray

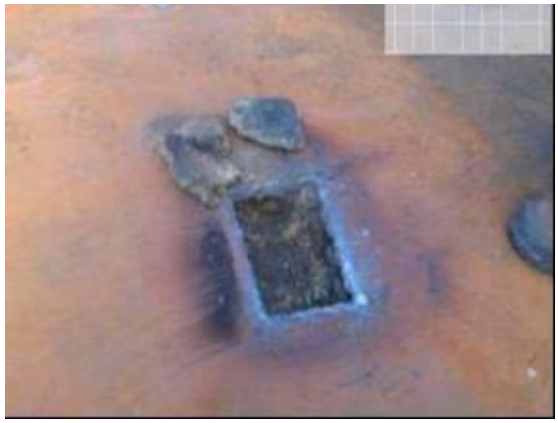
Description	Images
Dump truck trays such as the one illustrated above can be one of the major areas that harbour biosecurity risk material and none may be visible. These trays possess an internal lining or 'skin', which hides a hollow area, capable of harbouring biosecurity risk material. The gussets or ribs along the sides and across the bottom also have the potential to harbour significant amounts of biosecurity risk material (red arrows). Dump trays are prone to damage simply due to the size and weight of the cargo that they carry. If there is any evidence of hairline cracks, splits, new welding or evidence of repair, then all these areas need to be investigated. Trays with suspected biosecurity risk material inside cannot be released until completely verified.	
This tray comprises of two segments that are bolted together. Once apart, the ribs along the underside are open and exposed to biosecurity risk material (red arrows).	
This tray shows evidence of repair and therefore requires investigation of the gussets and ribs (red arrows).	

Description	Images
Red arrows indicate where the tray has been bolted together. The black rubber pads on the underside of the tray require thorough flushing to ensure cleanliness.	
The front of this tray showed signs of damage, and prior to import the biosecurity risk material was removed (red arrow). The department is not in a position to order the cutting of any part of any imported machine. If there is evidence of cracks, splits or repair, then it is the responsibility of the importer to prove that these areas are free of all biosecurity risk material.	

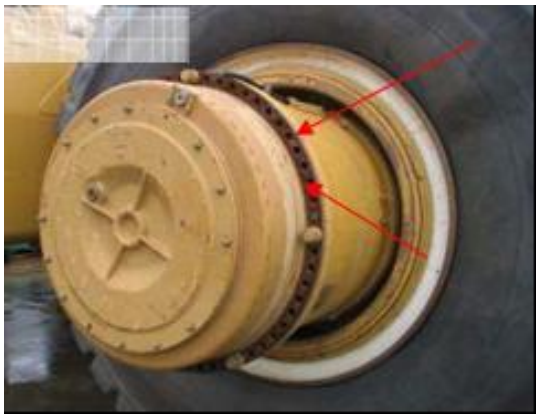
Description	Images
Tray cut prior to import, highlighting the hollow ribs/gussets on the underside of the tray (red arrows).	 
This tray showed signs of damage prior to import and as a result holes were placed at the rear of the ribs/gussets running along the sides (red arrows).	
Evidence of new welding on the side of this tray. Due to not being painted over, it appears rusty (red arrows).	

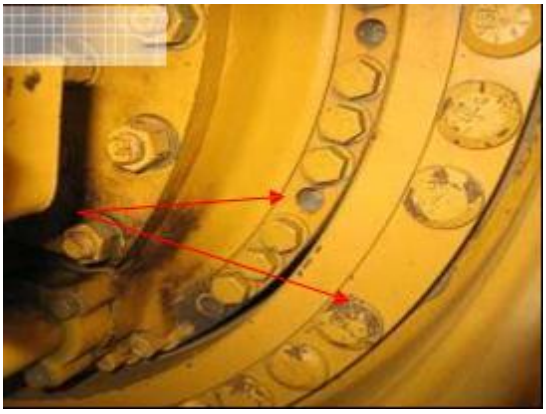
Description	Images
The outside front of the tray. Note the vertical red arrow indicating an opening. The right red arrow shows evidence of new welding. Although not clear in this photo, the blue arrow indicates a crack in the rib/gusset, which requires further investigation.	
Thoroughly clean the black rubber tray mounts. Check along all outside ribs/gussets for biosecurity risk material, cracks and splits (red arrows).	

Description	Images
Crack in the 'skin' and damage along the top of the side (red arrows).	 
An example of a crack in the tray of a dump truck. If areas like this are found, then they need to be investigated.	

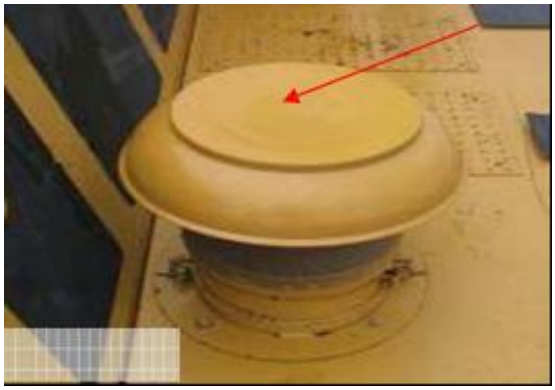
Description	Images
Once this crack was investigated, it revealed biosecurity risk material between the two 'skins'. The department does not direct any cutting, however if any cracks, splits or evidence of repair is evident, then that machine cannot be released until these areas are verified clean. It is the responsibility of the importer to demonstrate that these areas are free of all biosecurity risk material.	

Tyres and rims

Description	Images
Rear end of a dump truck. The outside dual wheels must be removed to allow a complete inspection. Please ensure that any exhaust channels are free of biosecurity risk material (red arrows).	
The outside dual wheel removed. On the topside of the rim is a protective plate, which cannot be accessed if the dual wheel is not removed (red arrows). See below.	

Description	Images
The protective cover on the rim has been removed, revealing biosecurity risk material (red arrow).	
Inside of the wheel rim. Note the biosecurity risk material still present inside the countersunk holes (red arrows).	
Examples of cracks in tyres that all need to be verified clean.	 

Accessories

Description	Images
The air-filter pre-cleaner (red arrow). Ensure this housing is removed to enable inspection.	
The oil tank situated above the engine is easy to access, however the underside is difficult to inspect and may require the use of a mirror. The coupling also requires inspection (red arrows).	
To enable a thorough inspection of the battery box, ensure that the batteries can be lifted and flushed underneath.	

Description	Images
All non-slip checker plate needs to be verified by flushing with high pressure water (some importers have chosen to completely remove).	
The right hand wheel arch from behind. On some models the box channels are open ended such as the ones illustrated above (red arrows). These require flushing in the presence of the inspecting officer to verify cleanliness.	
Check all mirrors. If cracked or pieces missing, best to check behind.